Infrastructure Platforms: Workstation

(1) Description/definition

A microcomputer system that is intended for individual use. A workstation may consist of several units that are connected together during installation: (1) the processor, which can be in a microtower or a minitower designed to fit unde the desk or in a unit that goes on top of the desk, (2) the display monitor, (3) and input devices – usually a keyboard and a mouse. . Today, almost all workstation computers come equipped with a built-in modem, a CD-ROM drive, a multi-gigabyte magnetic storage drive, a floppy drive and a Network Interface Card.

For our purposes the definition of the workstation will include the following categories:

Desktop - A desktop computer is a personal computer that is designed to fit conveniently on top of a typical office desk.

Laptop - A laptop computer, usually called a notebook computer by manufacturers, is a battery-powered personal computer generally smaller than a briefcase that can easily be transported and conveniently used in temporary spaces such as on airplanes, in libraries, temporary offices, and at meetings. A laptop typically weighs less than 5 pounds and is 3 inches or less in thickness. Laptops usually come with displays that use thin-screen technology. Laptops use several different approaches for integrating a mouse into the keyboard, including the touch-pad, the trackball, and the pointing stick.

Personal Digital Assistant (PDA)

PDA is a term for any small mobile hand-held device that provides computing and information storage and retrieval capabilities for personal or business, use, often for keeping schedule calendars and address book information.

We recognize that we have not addressed “Thin Client.”

Note: this implies that some individuals within the organization may have more than one workstation.

(2) Actions needed

a) Standardize on the best two in each category (desktop, laptop, and pda)
b) Establish the standards for the "required level of workstation performance" based on job description
c) Establish Departmental procurement contracts for the purchase/lease of the best N in each of the desktop categories (desktop, laptop, and PDA).
d) Make the procurement contracts available throughout the Department.

(3) Timelines

Because the relatively small cost of standardization of the desktop, will be quickly offset by savings in maintenance and training this should be implemented **as soon as practical**.

(4) Benefits, Costs, Capital strategy

Benefits:

User: A common desktop across organizations will reduce the training requirement as well as the new workstation order/delivery timeframe. A common desktop is the first component in establishing a common operating environment across DOE.

Manager: The establishment of a Common Operating Environment (COE) will:

a) Provide an increase in individual productivity by eliminating the learning curve associated with changing job positions or responsibility levels.
b) Provide a cost savings by decreasing the skill mix required to support the desktop environment (and reduce the number of FTE's required to support the smaller suite of workstations).
c) Simplify the purchasing process for desktop equipment.
d) Reduce required inventory of available spares.
e) The establishment of the Common Operating Environment will help reduce development costs by stabilizing the development environment..

Executive: Provide better utilization of budget resources by ensuring the correct amount of computing resources are provided for each position.

Costs: Range - low

Capital Strategy (e.g., buy, or lease):
Several recent industry studies indicate that the purchase price of the typical workstation represents only 24% of the total cost of operation. The "Total Cost Of Ownership/Operation" for both purchase and lease scenarios (including seat management) should be re-evaluated on a quarterly or semi-annual basis.

(5) Management Considerations: Policy, Governance

a) Establish process to ensure governance buy-in.
b) Publish governance indicating that as of a specified date, centralized support will (only) be provided for specified types of desktops.

(6) Other Considerations:

Links:

Technology refreshment cycles,
Common operating systems and office suites (as part of COE),
Accommodations for physically challenged,
Services

Prerequisites:

Central Help Desk
Service Level Agreements for workstation support,
Inventory of existing baseline by category
Establish a corporate technology refreshment cycle for workstations
Establish a Common Operating Environment for workstations.

Infrastructure Platforms: Servers

(1) Description/definition

Servers are scalable computers used to provide network services such as data, applications, mail, and file/print. This should include the keyboard and monitor but not include the Network Interface Card(s).

For our purposes servers can be subdivided into the following categories:

Workgroup –The workgroup server is the smallest of the three sizes of servers, and is intended to support network services for small groups within a common business function (up to about 60 seats). The standard for the workgroup server needs to be defined with adequate scalable resources to allow it to support either a general purpose role for small groups (such as file, print, and mail) or specific selected functions within the architecture (such as the host/server role of client/server applications). To achieve hardware uniformity and reduce operating cost, workgroup and departmental servers should have a common vendor. The operating system must meet POSIX-compliance standards and be consistent with existing application servers and the Common Operating Environment.

Departmental – The departmental server represents the intermediate size servers and is intended to provide network services for larger groups within one or more program offices (up to approximately 400 seats). The standard for this size server should include easily upgradable processors, disk storage, and network communications, to ensure adequate support for selected business functions (such as web, database, and communications, as well as the enhanced flexibility to achieve high performance in unique roles within the architecture. To achieve hardware uniformity and reduce operating cost, workgroup and departmental servers should have a common vendor. The operating system must meet POSIX-compliance standards and be consistent with existing application servers and the Common Operating Environment. The normal cycle of Technology Refreshment for this class of server should include an option to be recycled as a workgroup server.

Enterprise/Mainframe – represent the highest level of computer processing capabilities with processing power that is significantly superior to PCs or midrange computers. This general group of platforms consists of mainframes, symmetric multiprocessing (SMP) computers, and massively parallel processor (MPP) computers. Traditionally, mainframes have been

associated with centralized rather than distributed, computing environments. They are generally use by large organizations to handle data processing for company-wide administrative tasks like payroll or accounts payable

(2) Actions Needed

(1) Develop/consolidate standards to scale/size servers according to:

- Applications installed,
- Number of users supported,
- Transaction volume,
- Required data storage,
- LAN role or function (PDC or BDC, etc.)
- Other criteria TBD.

(2) Defined standards should include:

- Throughput and speed,
- Supportable operating systems (e.g. Unix, NT, Netware)
- Number of processors,
- Number of network interface cards to be supported,
- Random Access Memory,
- Size, speed, configuration, failover (disk mirroring), hot swap, and Alert capability of DASD (RAID, RAID-5, jukebox, etc.),
- General failover capabilities (system mirroring),
- Disaster Recovery capabilities and role,
- Remote monitoring capability (including SNMP Trap service),
- Remote recovery capability,
- Standby power duration requirement and alert capability,
- Hot swap capability (RAM, cards, or processors),
- Technology refreshment path and schedule,
- Target utilization levels,

(3) Timelines

Immediate cost savings can be realized by the establishment of a Consistent Operating Environment for servers, and the consolidation of servers supporting common existing services (e.g. print and file, mail, databases, application, etc.).

(4) Benefits, Costs and Capital strategy

Benefits:

User: Mostly transparent, but will produce a more stable end user environment.

Manager:

a) Reduce the number and types of server technologies that have to be supported.
b) Reduce the skill mix required to support those technologies (and possibly the number of FTEs).
c) Reduce purchase justification efforts by having predefined server categories
d) Reduces the cost of application development by providing a consistent application development environment.

Executive:

a) Reduce procurement costs by obtaining better pricing from a smaller number of vendors.
b) Provide a consistent acquisition strategy.
c) Provide a consistent budget planning strategy by evenly distributing the cost of technology refreshment over multiple budget planning cycles.

Costs: Range - medium,

Capital Strategy (e.g., buy or lease)

As with desktops, the "Total Cost Of Ownership/Operation" for servers under both purchase and lease scenarios should be re-evaluated on a quarterly or semi-annual basis.

(5) Management Considerations: Policy, Governance

a) Establish process to ensure governance buy-in.
b) Publish governance indicating that as of a specified date, centralized server support will (only) be provided for specified types of servers.

(6) Other Considerations:

Links:

Services
Consolidation Initiatives

Prerequisites

Define server categories,
Establish a technology refreshment cycle for servers,
Inventory of existing baseline by category,
Service Level Agreements for central support of servers
Define common server operating systems/environment.

Infrastructure Platforms: Operating Systems

(1) Description/definition

An operating system (sometimes abbreviated as "OS") is the program that, after being initially loaded into the computer by a bootstrap program, manages all the other programs in a computer. The other programs are called applications. The applications make use of the operating system by making requests for services through a defined application program interface (API). In addition, users can interact directly with the operating system through an interface such as a command language.

An operating system performs these services for applications:

In multitasking operating systems where multiple programs can be running at the same time, the operating system determines which applications should run in what order and how much time should be allowed for each application before giving another application a turn.

It manages the sharing of internal memory among multiple applications.

It handles input and output to and from attached hardware devices, such as hard disks, printers, and dial-up ports.

It sends messages to the applications or interactive user (or to a system operator) about the status of operation and any errors that may have occurred.

It can offload the management of what are called batch jobs (for example, printing) so that the initiating application is freed from this work.

On computers that can provide parallel processing, an operating system can manage how to divide the program so that it runs on more than one processor at a time.

All major computer platforms (hardware and software) require and sometimes include an operating system. UNIX, Windows 9X/NT, DEC's VMS, IBM's OS/2, AIX, and OS/390 are all examples of operating systems.

(2) Actions Needed

Provide a consistent operating system by standardizing on the best two operating systems for each category of both workstation and server.

(3) Timelines

Soon, but standards should be done now.

(4) Benefits, Costs, Capital Strategy

Benefits:

User: A common operating environment across DOE will reduce training requirements and increase productivity.

Manager:
a) Provide a cost savings by decreasing the skill mix required to support the common operating environment (and reduce the number of FTE's required to support the smaller suite of workstations).
b) Reduces the cost of application development by providing a common operating environment.

Executive: The common operating environment will lead to cost reductions in both development and operations.

Costs: Range – low, to develop standards

Capital Strategy (e.g., buy or lease)

Not applicable

(5) Management Considerations: Policy, Governance

a) Establish process to ensure governance buy-in.
b) Publish governance indicating that as of a specified date, centralized support will (only) be provided for specified types of operating systems.

(6) Other Considerations:

Links

Workstations,
Servers

Prerequisites

Establishment of the common operating environment.

Infrastructure Platforms: Video teleconferencing

(1) Description/definition

Ability to deliver teleconferencing, at multiple levels, integrated with interactive workgroup applications and network transmission of audio and video.

Three levels of teleconferencing:
Desktop,
Roll-About, and
Studio

(2) Action Needed

a) Standardize on the best two in each category (Desktop, Roll-About, and Studio)
b) Establish the standards for the "required level of performance" for each level
c) Establish Departmental procurement contracts for the purchase/lease of the best two in each of the desktop categories (Desktop, Roll-About, and Studio).
d) Make the procurement contracts available throughout the Department.

(3) Timelines

Later.

(4) Benefits, Costs, Capital Strategy

Benefits:

User: A common teleconferencing environment across DOE will reduce training requirements and increase productivity

Manager:
a) Provide a cost savings by decreasing the skill mix required to support the common teleconferencing environment.
b) Reduces the cost of video teleconferencing development by providing a common environment.

Executive: The common environment will lead to a cost reduction in operations.

Costs: Range - Medium to develop standards.

Capital Strategy (e.g., buy or lease)

Undetermined at this time.

(5) Management Considerations: Policy, Governance

a) Establish process to ensure governance buy-in.
c) Publish governance indicating that as of a specified date, centralized desktop support will (only) be provided for specified types of desktops

(6) Other Considerations:

Links

Workstations,
Operating Systems,
Scheduling of Services,
Network Infrastructure

Prerequisites

Workstations,
Operating Systems,
Network Infrastructure,
Inventory of Existing Baseline by Level,

Infrastructure Platforms: Voice

(1) Description/definition

Voice service includes local, long distance, and international dialing provided through the Headquarters Information Exchange (IX) System; specialized services such as operator-assisted calls (including large audio conference calls), voice mail, three-way calling, call forwarding, automatic ring-back, and customer calling cards.

(2) Action Needed

Voice service, as currently provided, appears to be optimized for the DOE environment.

(3) Timelines

N/A

(4) Benefits, Costs, Capital Strategy

N/A

(5) Management Considerations: Policy, Governance

N/A

(6) Other Considerations:

Voice over IP, FTS

Infrastructure Platforms: Network Access

Consolidated Wide Area Access, Local Area Access and Remote Access

(1) Description/definition

Connectivity for DOE Headquarters through Local and Wide Area Networks. This connectivity provides interoperability for 86 organizational Local Area Network (LAN) segments in two main headquarters and associated satellite building, and connectivity to the Headquarters mainframe systems. There are approximately 7,300 LAN connections in Headquarters.

Access to the Internet and World Wide Web, Electronic mail, and DOECast for information sharing through the LAN backbone infrastructure.

Interface services and communication links to field sites, other government agencies, and public/private business partners.

Network access includes the infrastructure, the cabling/hubs/switches/routers that form the interconnection of the networks and network nodes and the various protocols used to control and manage the transmission of data over the transport infrastructure.

(2) Action Needed

a) Standardize the various elements of the infrastructure to optimize interconnectivity.
b) Establish standards for the required level of performance for each element.
c) Establish Departmental procurement contracts for the purchase/lease of the best of each element.
d) Make the procurement contracts available throughout the Department.

(3) Timelines

Because the relatively small cost of standardization will quickly be offset by savings in maintenance, this should be implemented as soon as practical.

(4) Benefits, Costs, Capital Strategy

Benefits:

User: Seamless connection to the consistent operating environment regardless of geographical location.

Manager:
a) Provide a cost savings by decreasing the skill mix required to support network infrastructure
b) Simplify the purchasing process for network infrastructure elements.

Executive:
a) Reduce procurement costs by obtaining better pricing from a smaller number of vendors.
b) Provide a consistent acquisition strategy.
c) Provide a consistent budget planning strategy by evenly distributing the cost of technology refreshment over multiple budget planning cycles.

Costs:

The costs for establishment of the standards and procurement contracts is low.

Capital Strategy (e.g., buy or lease)

As with desktops and servers, the "Total Cost Of Ownership/Operation" for infrastructure elements under both purchase and lease scenarios should be re-evaluated on a quarterly or semi-annual basis.

(5) Management Considerations: Policy, Governance

a) Establish process to ensure governance buy-in.
e) Publish governance indicating that as of a specified date, centralized desktop support will (only) be provided for specified types of desktops

(6) Other:

Links

Services
Consolidation Initiatives

Prerequisites

Establish technology refreshment cycles for each element of the infrastructure.
Inventory of existing infrastructure baseline.